SONY

STEREO TAPECORDER
TC-200A

OWNER'S INSTRUCTION MANUAL

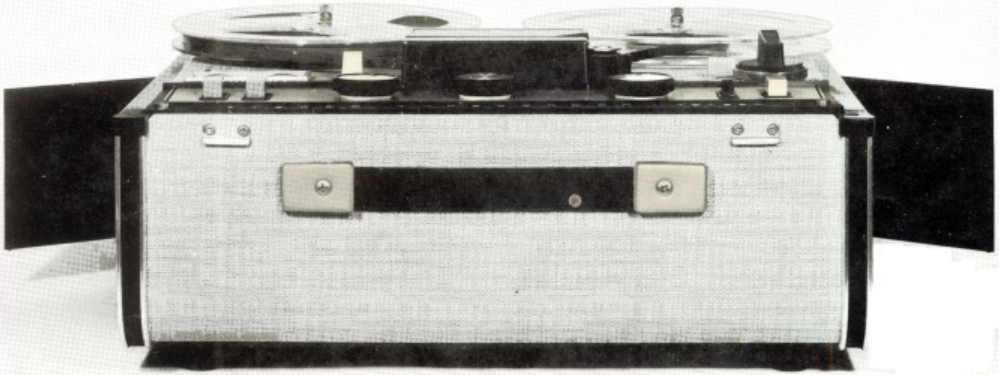
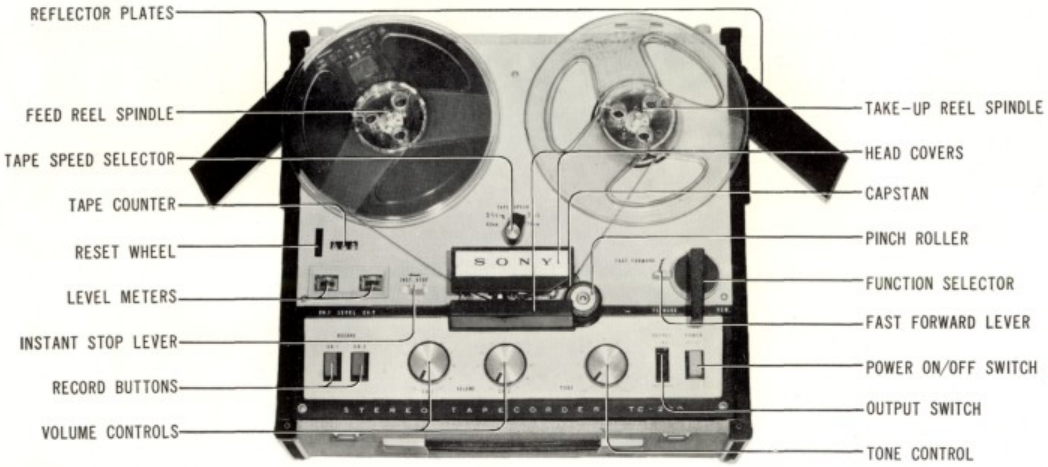


Table of Contents

Diagram of Controls 2
Technical Specifications 3
Stereo Recording and Playback Procedure 4
Operation of Controls 6
Drive Mechanism Controls 6
1. Function Selector 6
2. Fast Forward Lever 6
3. Tape Speed Selector 6
4. Instant Stop Lever 6
5. Tape Counter 6
6. Reflector Plates 7
Electronic Controls 8
1. Power On/Off Switch 8
2. Pilot Lamps 8
3. Volume Controls 8
4. Tone Control 8
5. Record Buttons 8
6. Level Meters 9
7. Output Switch 9
Input and Output Connectors 10
1. Microphone Inputs 10
2. Auxiliary Inputs 10
3. Speaker, Monitor/Line Outputs 11
4. Auxiliary Record/Playback Connector 11
Notes on 4-Track System 12
Monophonic Recording and Playback Procedure 13
4-Track Recording Procedure 13
4-Track Playback Procedure 13
Sound-on-Sound Recording 14
Tape Teaching 15
Public Address 16
Maintenance 17
Lubrication Chart 18
Schematic Diagram 19

Diagram of Controls



Technical Specifications

Power Requirement:	117 volts, 70 watts 60 cycles (50 cycles optional)
Tape Speeds:	Instantaneous selection 7½ ips or 3¾ ips (19 or 9.5 centimeters per second)
Frequency Response:	50–14,000 cps at 7½ ips ±3 db 50–10,000 cps at 7½ ips
Signal-to-Noise Ratio:	46 db
Flutter and Wow:	Less than 0.19% at 7½ ips Less than 0.25% at 3¾ ips
Erase Head:	In-line quarter track
Record/Playback Head:	In-line quarter track
Bias Frequency:	Approx. 55 Kc
Level Indication:	Two Level Meters
Level Controls:	Individual Controls on each channel for playback and record
Tone Control:	1 Tone Control for treble boost or roll-off operates both channels simultaneously.
Editing Facilities:	Instant Stop Lever, Automatic Tape Lifters, Fast Forward and Rewind, Manual Cueing and Digital Tape Counter
Reels:	7 inch or smaller
Outputs:	8 ohm Speaker outputs or high impedance line outputs selectable by switch (2) Auxiliary Record/Playback Connector (1)
Inputs:	Low impedance Microphone inputs (2) High impedance Auxiliary inputs (2)
Speakers:	3.5″ PM dynamic (2)
Power Output:	2 × 1.5 watts (max.)
Tubes:	6267 (×2), 30A5 (×3)
Transistors:	TX-128 (×2)
Diodes:	1T22G (×2), 1S125 (×1)
Weight:	Approx. 25.5 lbs.
Dimensions:	15.2″W × 14.1″H × 7.4″D

Stereo Recording and Playback Procedure

For monophonic recording and playback procedure, see page 13.

1. Preparation

Unsnap the fasteners and remove the lid from the main cabinet.
Take out Microphones and Power Cord from the rear pocket of the cabinet.
Open the REFLECTOR PLATES on the recorder sides.

2. To Connect the Power Line

Connect the Power Cord to the power supply and press the POWER ON/OFF SWITCH. Pilot Lamp beneath the LEVEL METERS will light when the recorder is ON.

6. To Start Recording

Keep the RECORD BUTTONS depressed and turn the FUNCTION SELECTOR to FORWARD. Tracks 1 and 3 of the tape will have been recorded. (To record tracks 4 and 2, see page 12.)

7. To Monitor Recording Contents

For speaker monitoring set the OUTPUT SWITCH to [SPEAKER].
Monitoring through earphones can be accomplished by plugging the crystal earphones to LINE OUT jacks and by setting the OUTPUT SWITCH to [LINE].

3. To Load and Thread Tape

Place an empty reel on the TAKE-UP REEL (right) SPINDLE and full reel of tape on the FEED REEL (left) SPINDLE. Pull out leader tape from the full reel and thread it between HEAD COVERS and wrap it firmly around the Take-up reel with SHINY surface to the outside.

4. To Select Tape Speed

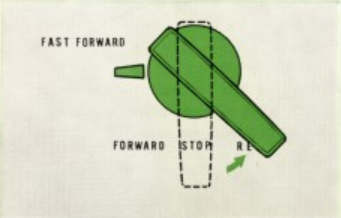
Select the desired tape speed of either 7½ ips or 3¾ ips and set SPEED SELECTOR to the proper position.
Rotate the Reset Wheel until three zeros [000] appear in the TAPE COUNTER. (See page 6.)

5. To Adjust Record Level

Plug the microphones into MIC jacks. (For recording from radio or TV set, see page 10.)
Press the RECORD BUTTONS and adjust CH-1 and CH-2 VOLUME CONTROLS to the proper level. (See LEVEL METERS, page 9.)

8. To Rewind the Tape

Upon completion of a recording, turn the FUNCTION SELECTOR to STOP. Turn the Selector to REW until three zeros [000] again appear in the window.

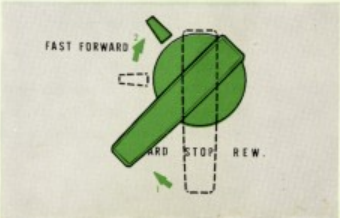


9. To Play Back

Set the OUTPUT SWITCH to [SPEAKER]. Disconnect the earphones and turn the Selector to FORWARD.
Adjust sound volume with VOLUME CONTROLS and sound quality with TONE CONTROL.

10. To Move the Tape Fast Forward

To move tape forward quickly to a desired position, place the Selector to FORWARD. Push FAST FORWARD LEVER until the lever clicks into position... then release the lever.



Operation of Controls

DRIVE MECHANISM CONTROLS

1. FUNCTION SELECTOR

FUNCTION SELECTOR controls forward/stop/rewind functions of the tape and each function is indicated below the Selector.

TO OPERATE

For FORWARD function turn the Selector clockwise.

For REWIND function turn the Selector counterclockwise.

NOTE: 1. Do not change from FORWARD to REWIND (or vice versa) until the tape comes to a complete stop.

2. Always keep the Selector in STOP position when the recorder is not in use.

2. FAST FORWARD LEVER

FAST FORWARD LEVER is used to move tape forward quickly to a desired position.

TO OPERATE

After the FUNCTION SELECTOR is placed in normal FORWARD position, push FAST FORWARD LEVER upwards, as indicated with an arrow, until the lever clicks into position... then release the lever. To stop FAST FORWARD motion, turn the Selector to STOP position.

3. TAPE SPEED SELECTOR

SPEED SELECTOR selects the desired speed of either 7½ ips or 3¾ ips (19 or 9.5 centimeters per second).

TO OPERATE

To change from 3¾ ips to 7½ ips, press down on SPEED SELECTOR knob and turn clockwise to the [7½] position. To change from 7½ ips to 3¾ ips, simply turn the knob counterclockwise and allow the knob to rise.

NOTE ON TAPE SPEED

Tape Speed	3¾ ips (9.5 cm/s)	7½ ips (19 cm/s)
Use when	Longer recording time is desired.	Better sound quality is desired.
Recording Time (1800 ft tape)	1.5 hours each Track	45 minutes each Track

NOTE: Do not change tape speed while the tape is in motion.

4. INSTANT STOP LEVER

The INSTANT STOP LEVER instantly and safely stops normal forward motion of the tape for editing and cueing. Both reels can still be rotated by hand in either direction while the lever is applied.

TO OPERATE

Push the lever to the left and hold until ready to release. Upon releasing the lever, the tape will immediately pick up normal forward speed.

5. TAPE COUNTER

The 3-digit numerical indicator of this recorder may be used in many ways. Some of the more useful are:

a. As a Tape Position Indicator

Rotate reset wheel upwards until three zeros [000] appear in the window when a full reel of tape is loaded and threaded. The TAPE COUNTER will then indicate how much tape has been wound and how much remains.

b. For Indexing

Make a note on the tape box or elsewhere as the recording is made.

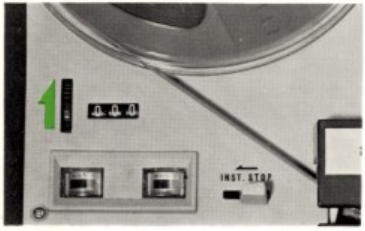
000-144 Radio Recording

145-195 Bob Sings.

196-255 Mary Makes a Speech... etc.

c. For Finding a Position on the Tape

When you are starting a new recording on an already partly recorded tape, you may set the TAPE COUNTER to [000] at the point where the new recording starts. It is then easy to return to this point when the recording of this section is completed without having to remember numbers or make notes.



6. REFLECTOR PLATES

Two REFLECTOR PLATES are provided with the recorder to reflect the sound of the built-in speakers toward the front.

Open the REFLECTOR PLATE to desired angle for most satisfying listening.

ELECTRONIC CONTROLS

1. POWER ON/OFF SWITCH

To switch power ON press down on the POWER ON/OFF SWITCH designated [POWER ON/OFF].
To switch power OFF press the button down again.

2. PILOT LAMPS

Located under the LEVEL METER inside the cabinet, this lamp will light when the recorder is ON. The lamp will change its color to RED when the RECORD BUTTON is depressed and the recorder is placed in RECORD mode.

3. VOLUME CONTROLS

One VOLUME CONTROL is provided for each channel to increase or decrease the recording or the playback level.
The knob designated [CH-1] controls the level of channel 1 and the knob designated [CH-2] controls the level of channel 2 respectively.

4. TONE CONTROL

TONE CONTROL is used to obtain desired tone quality for both channels simultaneously in playback mode only. Turn clockwise to emphasize treble tone and counterclockwise to emphasize bass tone.

5. RECORD BUTTONS

When the RECORD BUTTON designated [CH-1] is down, only channel 1 is in record mode, and when the RECORD BUTTON designated [CH-2] is down, only channel 2 is in record mode.
Stereophonic recording will be accomplished when both CH-1 and CH-2 RECORD BUTTONS are down.
A special feature of the RECORD BUTTONS to be locked in STOP mode gives the facilities for level setting and Public Address.

NOTE :

a. To release RECORD BUTTONS when one of the buttons is down; slightly press the other button, then the depressed button will rise.
b. To release RECORD BUTTONS when both buttons are down; firmly press one button down, and the other will be released. Slightly press this released button, then both buttons are now released.
c. RECORD BUTTONS will also be released by turning the FUNCTION SELECTOR to FORWARD. Be sure to return the Selector to STOP position to prevent the malfunction in the mechanism.

6. LEVEL METERS

Two LEVEL METERS are provided for recording and playback level indication.

In record mode, the deflection of the level meter needle should not exceed the boundary of the black and red zones.

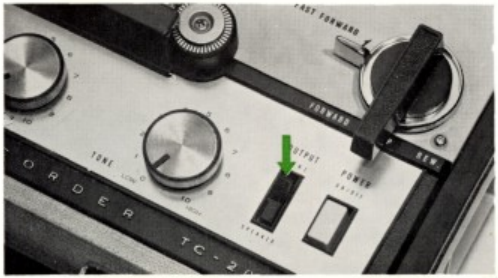
NOTE: While playing back through the built-in speakers, be sure to adjust the sound volume so that transient peaks do not cause the needle to go beyond the scale end.

7. OUTPUT SWITCH

This switch controls the output impedance for the [SPEAKER, MONITOR/LINE OUT] jacks.

a. Set the Switch to the [SPEAKER] position when playing back through the built-in speakers or when connecting to the external speakers.

b. Set the Switch to the [LINE] position when connecting to high impedance earphones or any other external amplifiers.



Input and Output Connectors

1. MICROPHONE INPUTS

Two Microphone Inputs are of the mini-jack variety and will accept mini-plugs.

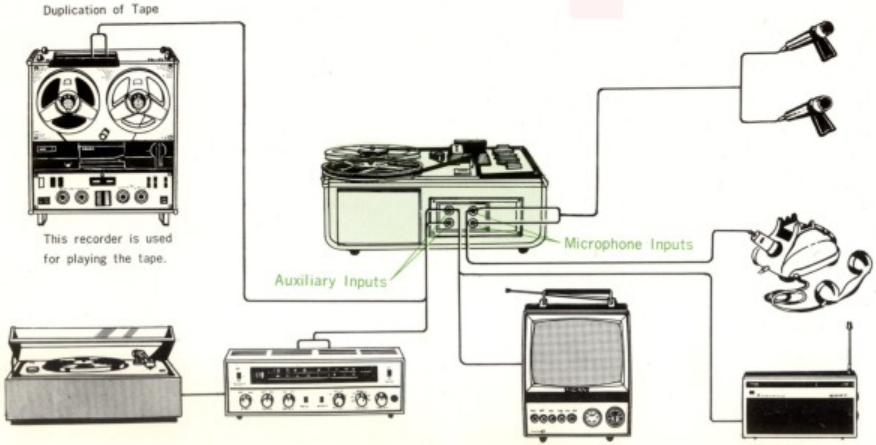
These input jacks are low impedance and designed for the SONY F-97 Microphones, supplied as accessories, or any quality low impedance microphones.

For recording telephone conversations, use the SONY Telephone Pick-up TP-4S, connected to one of these jacks.

2. AUXILIARY INPUTS

The Auxiliary Inputs are of the phono-jack variety and will accept phono-plugs.

These input jacks are high impedance and used for recording from any component such as radios, AM/FM tuners, TV, records, tape recorders or integrated amplifier "recorder" outputs.



3. SPEAKER, MONITOR/LINE OUTPUTS

The two output jacks are of the mini-jack variety and will accept mini-plugs.

The output jacks are adjusted for low impedance or high impedance according to the setting of the OUTPUT SWITCH.

a. With the OUTPUT SWITCH set in the [LINE] position, the recorder can be connected to a high impedance earphone or any integrated amplifier.

b. With the OUTPUT SWITCH set in the [SPEAKER] position, the recorder can be connected to external speakers. The ideal voice coil impedance of the speaker should be 8 ohms.

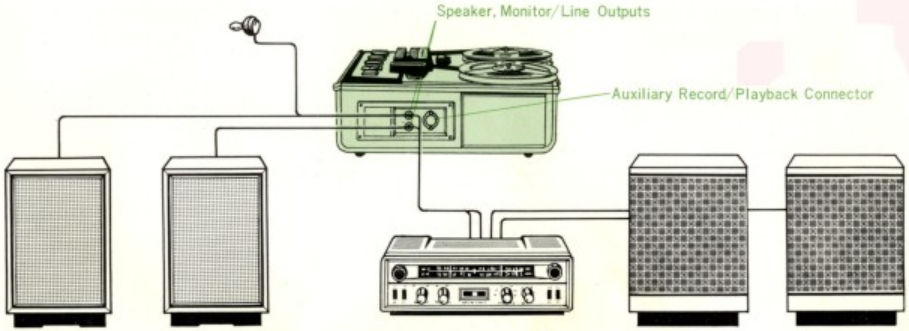
NOTE: The built-in speakers are designed primarily for monitoring; therefore, use an external speaker system when playback sounds of high fidelity are desired.

4. AUXILIARY RECORD/PLAYBACK CONNECTOR

(Used only in foreign countries)

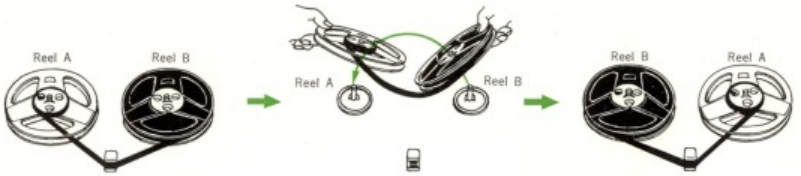
This socket is used for the interconnection of the high level inputs and line outputs of the recorder with outside integrated amplifiers of foreign manufacture that incorporate a matching socket.

A special SONY connector cable, RC-2, is available as an optional accessory.

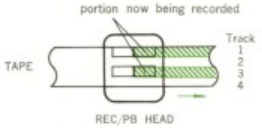


Notes on 4-Track System

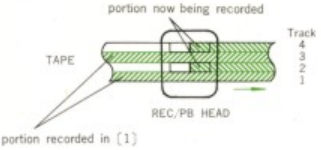
This recorder uses a 4-track system of recording/playback to give double the recording or playback time of a dual-track system.
In 4-track stereo recording, two separate pairs of stereo tracks are recorded on the tape.
To record tracks 4 and 2 (Side 2 of the tape) after tracks 1 and 3 (Side 1 of the tape) are completely recorded, simply reverse and invert the reels.
In monophonic recording four tracks can be separately recorded on one tape.



(1) Recording of Tracks 1 and 3



(2) Recording of Tracks 4 and 2 (reverse the reels of (1))



Monophonic Recording and Playback Procedure

NOTE: In all recording modes the erase head of the recorder will pre-erase the tracks for the corresponding tracks of the recording heads.

4-TRACK RECORDING PROCEDURE

1. Thread tape on the recorder and select desired tape speed.
2. Connect monophonic source to CH-1 input. (See page 10.)
3. Turn CH-2 VOLUME CONTROL to zero. Press CH-1 RECORD BUTTON and adjust CH-1 VOLUME CONTROL for proper recording level.
4. Keeping CH-1 RECORD BUTTON depressed, turn the FUNCTION SELECTOR to FORWARD.
5. When the end of the tape is reached, track 1 will have been recorded.

To continue with the other three tracks, proceed as follows:

6. To record track 4, do not rewind. Reverse reels (the loaded take-up reel is inverted and placed on the FEED REEL SPINDLE, and the empty reel is placed on the TAKE-UP REEL SPINDLE). Follow the above procedures 3 and 4.
7. To record track 3, reverse reels and change monophonic source connection from CH-1 to CH-2. By turning CH-1 VOLUME CONTROL to zero, adjust CH-2 VOLUME CONTROL for proper recording level, and turn the Selector to FORWARD.
8. Track 2 will have been recorded by simply reversing and inverting the reels.

4-TRACK PLAYBACK PROCEDURE

If a 4-track monophonic tape has been recorded in the sequence outlined in the previous chapter, it must be played in the same sequence as recorded; i.e. Track 1(CH-1) – Track 4(CH-1) – Track 3 (CH-2) – Track 2(CH-2).

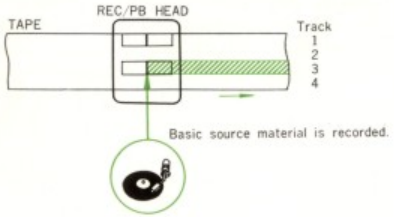
As you become more acquainted and adept with the functions of the recorder, you may wish to change the sequence of monophonic recording outlined above. It is advisable to establish a set sequence so that all tapes recorded monophonically are compatible.

Sound-on-Sound Recording

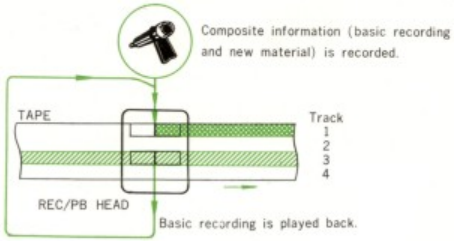
This recorder is equipped to produce "Sound-on-Sound" composite recordings. A small amount of practice with the following procedure will enable the user to become expert in the many fascinating uses of "Sound-on-Sound" recordings.

PROCEDURE

1. Record material on track 3 (CH-2) according to "Monophonic Recording and Playback Procedure", page 13.



2. Connect jacks CH-2 LINE OUT and CH-1 AUX. IN. with the SONY Connecting Cord RK-58, supplied as an accessory.
3. Set the OUTPUT SWITCH to the [LINE] position and plug a high impedance earphone into CH-1 [SP., MONITOR/LINE OUT].
4. Connect the microphone into CH-1 MIC input.
5. Keeping CH-1 RECORD BUTTON depressed, turn the FUNCTION SELECTOR to FORWARD. Adjust CH-2 playback level and CH-1 recording level by using VOLUME CONTROLS and LEVEL METERS respectively to obtain desired balance between microphone and the previously recorded information from track 3 (CH-2).
   The composite information, CH-2 and microphone, is now being recorded on track 1 (CH-1).

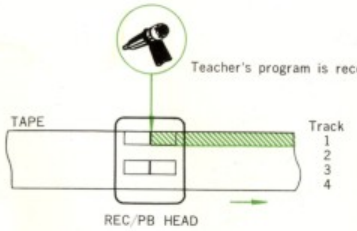


Tape Teaching

This recorder provides facilities to play back one track while the other track is being recorded. This exclusive feature is ideal for language students who wish to listen to a pre-recorded lesson on one track while recording the answers or repetitions onto the other track. Both tracks can later be played back separately or simultaneously for comparison.

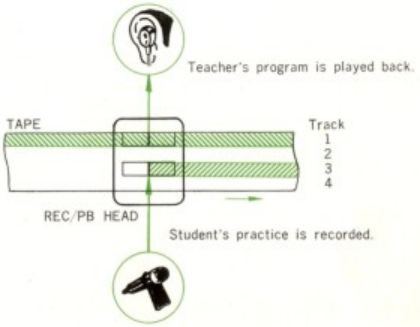
Master Recording

1. Record Teacher's program on track 1 (CH-1) according to "Monophonic Recording and Playback Procedure", page 13.



Practice Recording

2. Rewind the tape back to the beginning of the master recording. Connect a high impedance earphone to CH-1 MONITOR Output.
3. Connect the microphone into CH-2 MIC input.
4. Using CH-2 RECORD BUTTON, record your practice on track 3 (CH-2) by repeating or answering the master recording which is heard through the earphone.



Simultaneous Playback

5. Rewind and play back the tape in the same manner as a stereo tape; then, the master track and the practice track are simultaneously reproduced.

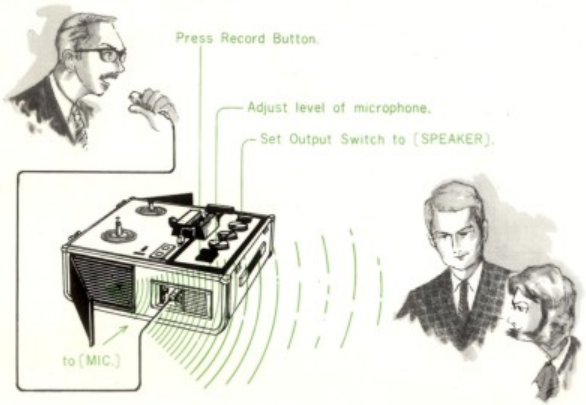
In the above method, the master and the practice recordings are made separately on different channels, so that the practice track can be repeatedly recorded without erasing the master track.

Public Address

This recorder provides facilities for public address by the use of a special RECORD BUTTON which permits the use of the built-in amplifiers independent of tape motion.

NOTE: 1. Stereo public address can also be accomplished by using both CH-1 and CH-2 facilities simultaneously.

2. Howling effect (acoustic feedback) may be caused when the microphone is too near the speaker or when VOLUME CONTROL is adjusted for too much sound volume. To avoid this, keep the microphone further away from the speaker or reduce volume.



NOTE ON VENTILATION

Obstruction of the ventilation grill located on the bottom of the recorder will result in a detrimental heat rise inside the recorder.

Do not place this recorder on a soft surface such as carpeting, cushions, etc. while operating.

This will insure proper ventilation of the recorder.

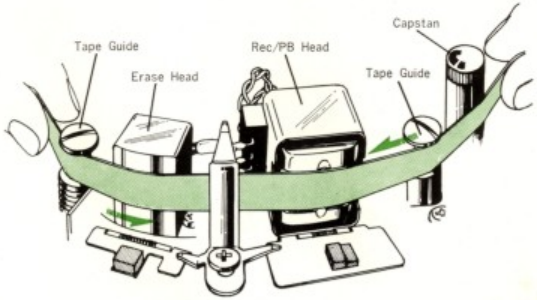
Maintenance

a. CLEANING HEADS

Intimate contact between heads and tape is important for optimum performance. Generally, cleaning heads after every 10 hours of use will be sufficient.

TO CLEAN

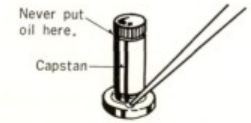
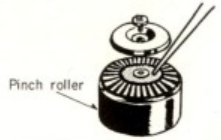
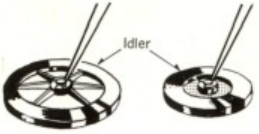
Take the head cleaning ribbon furnished, or a piece of soft, clean fabric dampened with denatured alcohol and carefully wipe the portion of the heads over which the tape travels. The same procedure is recommended for cleaning the CAPSTAN and PINCH ROLLER surfaces. This will prevent oxide deposits from causing wow and flutter.



b. DEMAGNETIZING HEAD

Through continuous use, residual magnetism will be gradually built up on the head and excessive residual magnetism on the head will produce noise while the tape is being played. Therefore, periodic use of the SONY HE-2 Head Demagnetizer is recommended for best possible performance.

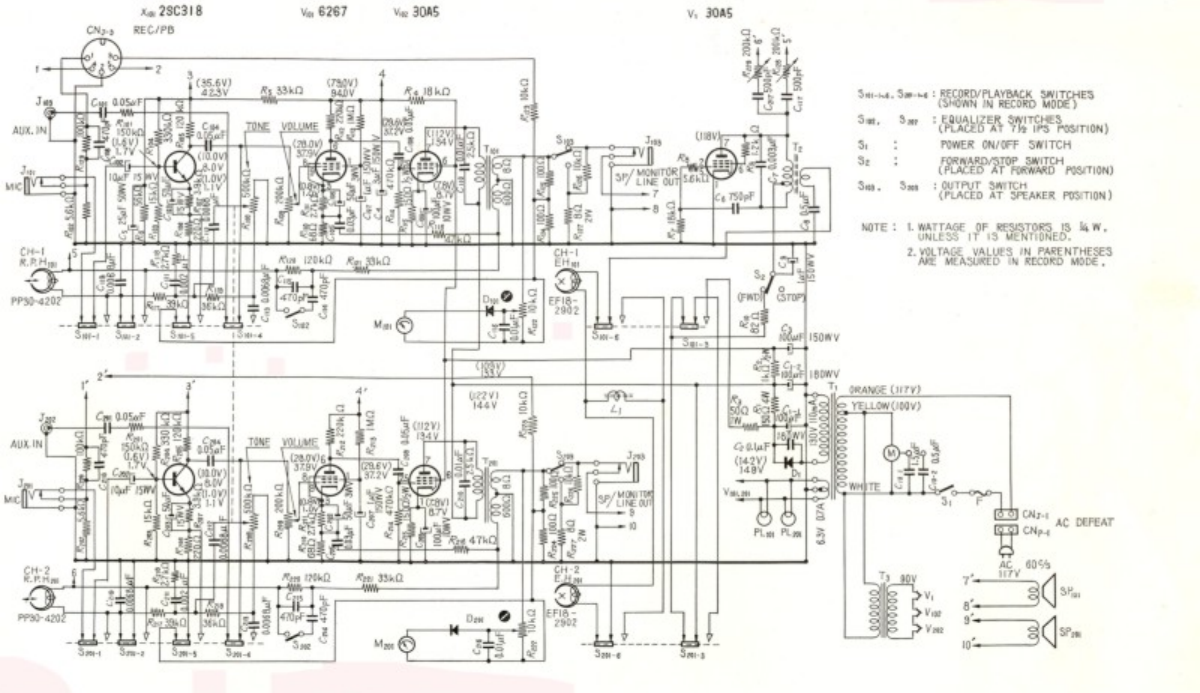
Lubrication Chart

Parts to lubricate	Quantity of oil	Type of oil	Remarks	Figures
Capstan bearings	3 drops once a month	light machine oil	Don't stain capstan surface.	
Pinch roller bearings	1 drop once a month	light machine oil	Don't stain rubber surface.	
Reel shafts	1 drop once a month	light machine oil		
Idler shafts	1 drop once a month	light machine oil	Remove top cover panel to gain access.	

NOTE: (1) Avoid excessive lubrication. It will cause slippage in the mechanism and contamination of your tape.

(2) If stalling occurs in FAST FORWARD motion, clean each rubber idler wheel under the top panel with a soft cloth moistened with denatured alcohol.

Schematic Diagram



S_{101-1}, S_{201-1} : RECORD/PLAYBACK SWITCHES (SHOWN IN RECORD MODE)

S_{102}, S_{202} : EQUALIZER SWITCHES (PLACED AT 7½ IPS POSITION)

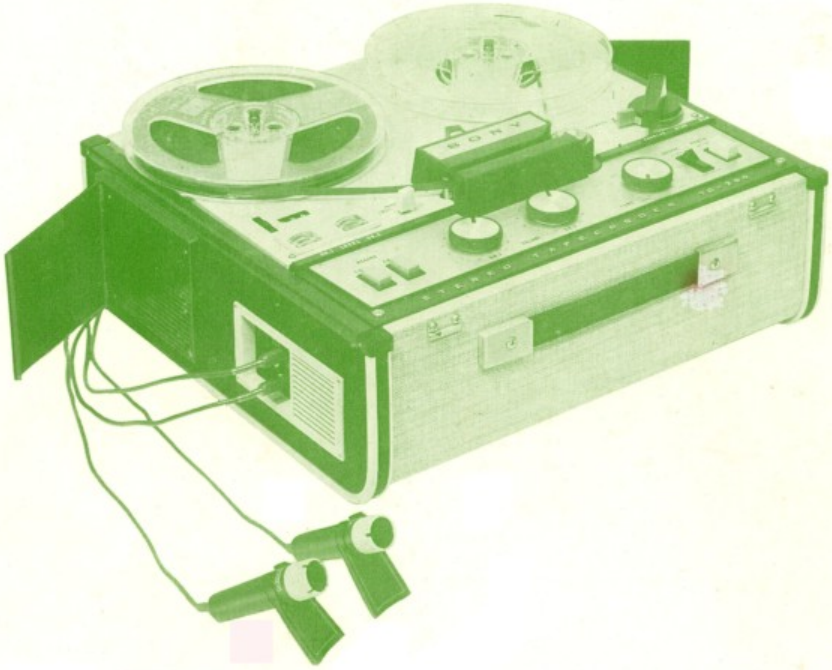
S_1 : POWER ON/OFF SWITCH

S_2 : FORWARD/STOP SWITCH (PLACED AT FORWARD POSITION)

S_{103}, S_{203} : OUTPUT SWITCH (PLACED AT SPEAKER POSITION)

NOTE : 1. WATTAGE OF RESISTORS IS ¼ W, UNLESS IT IS MENTIONED.

2. VOLTAGE VALUES IN PARENTHESES ARE MEASURED IN RECORD MODE.



You are now the owner of a complete music system that both records and plays 4-track Stereophonic tapes. The precision performance and professional features of the Model 200 A will introduce you to an exciting new world of "living sound".

This owner's manual explains the controls, operation and maintenance of your new Model 200 A.

Read the information contained in this manual carefully before operating the recorder.

Save this manual for future reference.